ORIGINAL

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's	)	CC Docket No. 94-102
Rules to Ensure Compatibility	)	
with Enhanced 911 Emergency	)	
Calling Systems	)	

To: Chief, Wireless Telecommunications Bureau

TRUEPOSITION, INC. RESPONSE TO E911 COMMENTS AND WAIVER REQUESTS

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SUMMARY

By expressing a willingness to consider proposals to "phase in" E911 Phase II implementation or apply the Phase II requirements only to new wireless phones, the Wireless Telecommunications Bureau ('Bureau") has opened the door for a large number of waiver requests. On February 4, 1999, more than 20 parties filed comments seeking waivers or other forms of relief from the Phase II deadline in order to explore handset-based approaches to Automatic Location Identification ("ALI") implementation. Yet the waiver requests do not meet the standards set forth in the Waiver Notice, and do not demonstrate any technical or economic infeasibility that would justify a waiver of the Phase II ALI rules or any modification of the nearly three year-old obligation to implement Phase II ALI technology.

TruePosition, Inc. has worked closely with CMRS carriers, the public safety industry and the Commission to develop network-based E911 location technology that can provide 270 million Americans with wireless E911 protection that, until now, has not existed for CMRS users. In doing so, TruePosition, other providers of ALI solutions, and the American public have relied on the Commission's consistent pronouncements that it would not stall E911 implementation, but instead exercise technological neutrality by "adopt[ing] general performance criteria rather than extensive technical standards." Thus, carriers may choose any technological standard that can comply with the 125 meters RMS standard. The grant of waivers would undermine this marketplace approach in favor of modifying the ALI rules to aid the lagging development of GPS based ALI technologies, and also forsake all Americans by relieving carriers from the ALI obligations to locate *all* wireless subscribers by October 2001.

Fortunately, the waiver requests do not provide any reason or excuse why the American public should wait one day longer for critical life-saving technology. The waiver proponents have not shown when or how deployment of their handset-based solutions will occur, and the waiver requests have not and cannot meet the Commission's traditional waiver standards or the Waiver Notice guidelines. Further, the waivers do not demonstrate any technical or economic reasons that would justify a modification of the established standards and performance obligations. Instead, waiver proponents merely offer "potential" ALI benefits of handset based technologies that fail even to exceed the present capabilities of network-based, Phase II-compliant technologies. Therefore, a grant of the waivers would delay the universal deployment of handset-based technologies over 100 million CMRS users for an undetermined time period. Given the Commission's previous determination that wireless E911 implementation is imperative to the lives and safety of CMRS and non-CMRS users, such a delay would contravene the Commission's statutory mandate to "promote the safety of life and property through the use of wire and radio communications."

Accordingly, the Bureau must deny the waiver requests and reiterate the mandate for timely implementation of wireless E911.

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TRUEPOSITION, INC. RESPONSE
TO E911 COMMENTS AND WAIVER REQUESTS

TruePosition, Inc. ("TruePosition") hereby responds to the Enhanced 911 ("E911") comments and waiver requests filed February 4, 1999 in the above-captioned proceeding. On December 24, 1998, the Wireless Telecommunications Bureau ("Bureau") released a public notice (the "Waiver Notice") outlining possible guidelines for waiving the Phase II Automatic Location Identification ("ALI") rules for handset-based technologies.[1] Following a rulemaking process that began five years ago and was completed three years later after significant and open debate, the Commission issued the ALI rules and assured that all Americans will have the benefit of critical life-saving E911 location technology by October 2001. By its terms, the Waiver Notice was designed to assist the Bureau in its determination of whether and when to grant waivers within narrowly construed "exceptional

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[1] See Wireless Telecommunications Bureau Outlines Guidelines for Wireless E911 Rule Waivers for Handset-Based Approaches to Phase II Automatic Location Identification Requirements, CC Docket No. 94-102, Public Notice, DA 98-2631.

circumstances." Based upon the responses filed, it appears as though the Waiver Notice has been interpreted as a *de facto* rulemaking – another opportunity to seek delay or modification in implementation of the ALI rules. At least 20 commercial mobile radio service ("CMRS") providers, whose territories cover all regions of the United States, responded to the Waiver Notice seeking waivers or other forms of relief from the Phase II deadline in order to explore handset-based approaches to ALI implementation. Unfortunately, these comments and requests, if granted, would forsake all Americans (including all CMRS users – now almost 70 million in number and estimated to reach 100 million by late 2001) by relieving carriers from the ALI obligations to locate *all* wireless subscribers by October 2001.

Fortunately, the waiver requests *do not* provide any reason or excuse why the American public should wait one day longer for critical life-saving technology. The waiver requests *do not* meet the standards or requirements set forth in the Waiver Notice; *do not* provide any specificity regarding handset-based capabilities or otherwise demonstrate any technical or economic reasons that would justify a modification of the established standards and performance obligations; *do not* propose a remedy for locating the 100 million or more wireless handsets that will not be equipped with GPS or other handset-based location technologies by the deadline, thereby relegating these CMRS users to ALI "have nots" if handset-based ALI solutions were adopted; *do not* demonstrate the existence of location technology superior, or even equal, to that which is commercially available today and which already meets (and in many cases exceeds) the Phase II ALI standard; and *do not* justify why,

after years of public debate and careful deliberation, the Bureau should now discard all of the Commission's, the CMRS industry's, and the public safety industry's prior efforts to afford 270 million Americans the certainty and level of protection provided under the existing rules.[2]

In implementing the ALI rules, the Commission strove for, and achieved, technical and economic neutrality in the pursuit of promoting and protecting the public interest. The ALI rules specify *performance* criteria that must be implemented, allowing the marketplace to determine the myriad of technical and economic alternatives available to CMRS providers in fulfillment of the requirements. The location technology marketplace exists and is thriving in response to the rules, with several different types of workable network-based solutions already available. There is absolutely no justification for the Bureau to relieve carriers from their obligations to locate *all* CMRS users by October 1, 2001, and the record created by the comments and waiver requests is entirely void of any facts that would support such relief. The Bureau should act as expeditiously as possible to deny the requested waivers and enforce the mandate of the ALI rules. This will avoid confusion and obfuscation in the marketplace, as well as unnecessary delay in the implementation of a long overdue public benefit.

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[2] Any rule change or industry-wide waiver must be prefaced by a notice of the Commission's intent to do so and must be supported by substantial evidence in the record. See generally 5 U.S.C. § 706; Florida Cellular Mobil Communications Corp. v. FCC, 28 F.3d 191 (D.C. Cir. 1994); People of the State of California v. FCC, 905 F.2d 1217 (9th Cir. 1990).

I. BACKGROUND

To fulfill its statutory mandate of "promoting safety of life and property through the use of wire and radio communications," the Commission adopted rules requiring all CMRS carriers to deliver to public safety answering points ("PSAPs") the location of all CMRS 9-1-1 callers.[3] The Commission recognized that ALI technology for wireless phones would enable emergency rescue personnel to reach and administer care to callers who "are disoriented, disabled, unable to speak, or do not know their location."[4] Accordingly, it required all CMRS carriers to implement Phase II ALI by October 1, 2001.

As the record in this proceeding reflects, TruePosition is a leading provider of network-based E911 location technology. TruePosition's ALI technology is capable of determining the location for all existing types of analog and digital CMRS networks (GSM, TDMA, CDMA, ESMR) well within the Phase II requirements.[5] In fact, TruePosition has

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3 See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 18676, ¶ 8 (1996) ("E911 Report and Order").

4 Id. at ¶ 4.

5 See Attachment 1, Press Release, "TruePosition Releases Series 2 Wireless Location System," released Feb. 1, 1999.

commercially installed its system in Houston,[6] has a live TDMA system in operation,[7] has concluded successful trials in New Jersey, and is initiating field trials for its first CDMA system in the second quarter of this year. TruePosition can readily extend its technology to each of the almost 70 million current CMRS subscribers. TruePosition's deployed technology already exceeds the 125 meters RMS standard for both digital and analog interfaces. Further, CMRS network-integrated testing is resulting in continued improvement in TruePosition's system accuracy. In short, TruePosition's wireless location system works and is available *now* – more than two years prior to the Phase II implementation deadline. Further, at least seven other competing network-based solutions using various technologies are also available or in development.[8]

TruePosition has worked closely with the Commission, state and local governments, the Cellular Telecommunications Industry Association ("CTIA"), CMRS

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6 See Attachment 2, Press Release, "TruePosition, Inc. and Shell Affiliate Announce Agreement to Develop Commercial Location Service," released Nov. 11, 1998.

7 See Attachment 3, Press Release, TruePosition Release TDMA Modules for Wireless Location System," released Feb. 1, 1999.

8 For example, the August 1998 CTIA E911 Location Implementation Conference in San Francisco included the following network-based vendors: KSI (using angle of arrival "AOA" technology); Sigma One (using AOA/time difference of arrival ("TDOA") technology); Cambridge Positioning (using time of arrival ("TOA") technology); Corsair Communications ("TDOA"); Grayson Communications ("TDOA"); and US Wireless (using "radio camera" technology). In addition, Nokia, Nortel, and Lucent presented network-based approaches and CellLoc is another TDOA vendor.

carriers, and public safety organizations in developing its technology. In October of 1997, CTIA presented TruePosition with the prestigious "APPY" Award for the Best Wireless Hardware Application at CTIA's Annual Wireless APPS Conference. TruePosition and other providers of ALI solutions have relied on the Commission's consistent pronouncements that it would exercise technological neutrality by "adopt[ing] general performance criteria rather than extensive technical standards,"[9] thereby allowing carriers to choose any technological standard that can comply. This technology neutral decision to "let the marketplace decide" ensured that whichever technologies could comply with the E911 rules would compete for carrier deployment opportunities. Waivers and rule changes undermine this marketplace approach in favor of modifying the ALI rules to buttress the lagging development of GPS-based ALI technologies. Indeed, the "inescapable effect of . . . extending time for handset approaches will be to freeze or stall" the development of network-based solutions.[10]

By suggesting guidelines for waivers, therefore, the Bureau – perhaps unintentionally – has invited carriers to adopt a wait-and-see approach to E911 implementation.[11] This contravenes the Commission's stated policies, industry efforts, and

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9 See E911 Report and Order at ¶ 76.

10 See Public Safety Associations' Comments at 5.

11 At least 20 carriers representing hundreds of MSAs, RSAs, MTAs, BTAs, and ESMR service areas and covering virtually every square mile of the United States has sought, or indicated it will seek, an E911 waiver. In fact, at least one commenter views the waivers as only the *first round* of waiver requests in this proceeding. See Nextel Comments at 3 (asserting that "[e]nforcing February 4, 1999 as the only date on

Congress's contemporaneous efforts to jumpstart E911 deployment through legislation supported by the wireless industry that would promote E911 number uniformity and limitations on carrier liability.[12] Indeed, for the last two years there has been a concentrated effort by both the Commission and the industry to expedite E911 availability. Specifically, Chairman Kennard has, on more than one occasion, challenged wireless carriers "not just to meet, but to beat" the Phase II E911 deadline.[13] CTIA has similarly urged the wireless industry to speed the implementation of E911.[14] The Waiver Notice, however, has undermined these efforts by precipitating so many waiver requests that merely expose the latent deficiencies in handset-based ALI solutions and signal a pause in ALI implementation.[15]

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which waivers are accepted would be arbitrary and capricious, and should not preclude *future* waiver requests.") (emphasis added).

12 See The Wireless Communications and Public Safety Act of 1999, H.R. 438.

13 See Chairman William E. Kennard, "Crossing Into the Wireless Century," Speech at the CTIA Convention, New Orleans, Louisiana Feb. 9, 1999 ("Kennard Speech"); see also William E. Kennard, "Speech to Wireless 98," Atlanta, Georgia, Feb. 23, 1998 (encouraging CMRS carriers to implement E911 ALI technology before the 2001 deadline).

14 See Radio Communications Report, "CTIA Seeks to Reactivate E911 Coalition," Aug. 31, 1998; see also Mobile Communications Report, "Cellular," Sept. 7, 1998.

15 The Commission has previously noted that CMRS carriers have had "sufficient notice to prepare for the implementation of E911 features since 1993, and it is not necessary to delay the October 1, 2001 deadline." To the extent that there were any delays which would affect this time frame, the Commission asserted that it would not take steps to resolve technical differences, but instead would take actions "necessary to implement E911 service without undue delay." See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Memorandum Opinion and Order, 12 FCC Rcd 22665, ¶ 121

Waivers would unnecessarily stall Phase II implementation for tens of millions of CMRS users and result not only in unnecessary death and serious injury among CMRS users, but also among the 200 million non-CMRS users who benefit from calls made by CMRS "good samaritans."[16] No such result can be in the public interest or justify a conclusion that the purpose of the E911 rules – to save lives – would be furthered by excusing compliance without justification for doing so.[17] Thus, the time has come (again) for the Commission to reaffirm that compliance with the Phase II standards will not be excused except in "extraordinary circumstances."[18] Wireless subscribers cannot and must not wait another 3 to 5 years or more because of the possibility that, at some indeterminable point in the future, unproven technologies *may* eventually work, albeit not in a manner that would

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(1997) ("E911 Memorandum Opinion and Order").

16 Indeed, in its initial trials in New Jersey TruePosition that found as many as one-half of the CMRS 9-1-1 calls were made to inform authorities of accidents or other emergencies exclusively involving third parties, not the caller. See also E911 Memorandum Opinion and Order at ¶ 34 (the Commission recognizing that many wireless calls are from "Good Samaritans" reporting traffic accidents and other emergencies).

17 TruePosition agrees with the Public Safety Associations' comment that it would be a greater benefit to public safety and the public interest if vendors of handset-based solutions were to work diligently toward the existing deadline, rather than seeking an extension. See Public Safety Associations' Comments at 5.

18 See E911 Report and Order at ¶ 84. Although rural CMRS carriers with sparsely located cell sites may have additional difficulties in providing Phase II E911, TruePosition believes there are several remedies to these difficulties and is eager to work with these service providers, the Commission, and others to implement such solutions within the prescribed deadlines.

yield any benefits beyond that offered by network-based ALI solutions today. Grant of the recent waiver requests would amount to technological *favoritism* rather than technological neutrality and would defer implementation of the most eminent lifesaving tool for CMRS users in the new millennium – wireless E911.

II. GRANT OF THE PENDING WAIVER REQUESTS WILL DELAY E911 IMPLEMENTATION AND WILL ENDANGER LIFE AND PROPERTY

In 1997, CTIA estimated that 55 million CMRS subscribers made 83,000 wireless emergency calls per day, or 30 million calls over the year. In 1998, that rate rose to approximately 100,000 wireless emergency calls per day from roughly 65 million CMRS users.[19] That translates into more than 36 million calls from CMRS subscribers in 1998. This number will increase exponentially as the number of wireless subscribers increases.[20] Tragically, every year in this country 42,000 people die in car accidents, nearly 20,000 of which die before they reach the hospital.[21]

Studies show that reduction in response times by emergency medical services ("EMS") is the most crucial factor in reducing the injuries and deaths that result from serious

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19 See CTIA Press Release, "Wireless Industry Is Model of Competition in Telecommunications," released Feb. 8, 1999.

20 By the end of 2001, it is estimated that there will be as many as 100 million CMRS subscribers. See Donaldson, Lufkin & Jenrette, "The Wireless Communications Industry," Spring 1998, p. 18 (DLJ Wireless Industry).

21 "Automatic Crash Notification: The Public Safety Component of the Intelligent Transportation System," AirMed at 36 (March/April 1998).

trauma. ALI technology will enable EMS to reach and administer care to crash and other trauma victims during the "golden hour" in which trauma victims can be stabilized. If such trauma victims go into an irremediable state of shock within 10-20 minutes of an accident, however, then there are only "golden minutes" during which EMS can enhance victim survival.[22]

Given the number of accidents and wireless emergency calls placed in 1998, it is evident that ALI technology is the most effective resource that public safety organizations, forced into search and rescue operations, have to access such trauma victims and reduce the loss of life. The grant of any waiver requests will delay the introduction of this technological safety net. Although many of the waiver proponents promote the eventual use of handset-based technology, not one of the proponents specified when deployment of such technology would occur. Whereas some carriers suggest that GPS handsets will be available between 2000 and 2001, none offer reliable data to support their assertions or explain how they will comply if such best laid plans are not attained.

Indeed, several factors impede the rapid development and deployment of the primarily GPS-based technology. First, workable and commercially available handset-based solutions have yet to be developed. Second, there is no uniform inter-operability between the varying handset-based solutions being developed. Accordingly, multi-tiered standardization

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[22] Stewart, R.D., Prehospital care of trauma in McMurtry, R.Y. and McLellan, B.A., Management of blunt trauma, Baltimore: Williams and Wilkins: p. 23-29, 1990.

processes for both the handset and network infrastructure are required before handset-based solutions can be initially deployed. Finally, even the waiver proponents acknowledge that after initial deployment it will take at least four years for handset-based technologies to capture even a *majority* of the market.[23] In short, the Commission cannot rely on the lofty expectations made by handset-based proponents. The record demonstrates that the only guarantee handset-based solutions can offer at this point in time is protracted delay of Phase II E911 to the American public.

A. A Workable Handset-Based Solution Does Not Exist

The waiver proponents assert that if the Commission gives them more time they will not only meet, but perhaps exceed, the Phase II requirements. Yet, given the technological drawbacks of GPS and other handset-based solutions, it is clear from the minimal data supplied and the waiver proponents' comments that handset-based technologies will not be ready for commercial deployment for an indeterminable amount of time. For example, many carriers state that handset-based solutions *may* provide ALI with significant accuracy and reliability,[24] and that more tests are needed to "gauge the feasibility of the handset-based approach."[25] In fact, AT&T Wireless bluntly admits that "handset-based

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[23] See SnapTrack Presentation to the FCC, October 1998 in CC Docket No. 94-102; see also DLJ Wireless Industry pp. 10, 58-59.

[24] See AirTouch Communications, Inc. Comments at 7; PrimeCo Comments at 3, 5; US West Comments at 5; AT&T Wireless Comments at 2.

[25] See PrimeCo Comments at 6; US West Comments at 6.

solutions are not yet ready for testing, much less deployment."[26] AirTouch also admits that "further testing and development is needed to determine actual performance and feasibility."[27] In short, handset-based solutions are not ready and will not be commercially available and in the hands of the American public until well after the Phase II E911 deadline.

Furthermore, carriers submitted no new data demonstrating any realistic handset-based ALI testing. Current claims of "improved accuracy" are not based on real-world field testing or other hard data. The improved accuracy rates rely, instead, on GPS-handset *prototypes* that utilized an *external* GPS antenna and not an antenna integrated into the handset. Tests that used an *internal* GPS antenna unequivocally demonstrate that such an integration will lead to significant performance degradation.[28] Despite assertions to the contrary, there is *no* published evidence that commercial-grade GPS-handsets (*i.e.*, those with internal antennae) can reliably deliver *any* location information, let alone "more accurate" location data. Thus, the claims of improved accuracy or reliability are now nothing more than hopes that the GPS drawbacks and compatibility issues can be resolved.[29]

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[26] See AT&T Wireless Comments at 5.

[27] See AirTouch Comments at 9.

[28] "GPS Antenna Handset Integration Issues for Assisted GPS Positioning Method," Motorola, Inc., July 22, 1998 (submitted to the T1P1 standards body, T1P1 5/98-348) (concluding that GPS antenna handset integration will lead to significant performance loss as compared to external antennas used for prototype systems).

[29] Indeed, the fact that the waiver proponents offer only 90-meter accuracy reflects that they reject the widely heralded projections by SnapTrack that handset-based

Such inherent GPS limitations include satellite "line-of-sight" availability. A GPS handset will not function properly unless at least four satellites are visible. Generally, if the 9-1-1 caller's direct line of sight to the satellite is blocked by tall buildings or heavy foliage, he will be unlocatable.[30] Moreover, GPS handsets would suffer from delays in the calculation of location data[31] and inherent signal inaccuracy.[32]

Further, compatibility and performance failings raise additional safety and deployment concerns surrounding GPS-based ALI technologies. The majority of GPS-based systems require extensive modifications to both networks and phones and will require the

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technologies can provide 40-meter accuracy.

30 See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Notice of Proposed Rulemaking, 9 FCC Rcd 6170, 6178, ¶ 46 (1994).

31 When a GPS handset is first turned on, it must first search for and locate the four visible satellites. Depending upon the equipment design, current GPS receivers might take from 30 seconds up to several minutes to achieve a "position fix." To protect against these performance differences undermining ALI protection, the Commission may have to establish GPS handset performance criteria as part of its equipment authorization program.

32 There are accuracy signal errors inherent in GPS measurements including, among other things, selective availability (degradation imposed on non-military uses). Such an error typically degrades GPS measurements over 100 meters. If the problem of selective availability is resolved, the margin for horizontal error changes from 101.2 meters to 32.5 meters. Thus, even if the selective availability error is resolved, the GPS measurements of a 90-meter accuracy will most likely have a margin of error of 32.5 meters. See "The Global Position System: Charting the Future", National Academy of Public Administration and National Research Council, May 1995 ("NAPA Report"), at Chapter VII, "Performance Improvements to the Existing GPS Configuration".

nationwide installment of a single ALI vendor's system in order to ensure universal coverage. Yet "no nationally deployable, fully tested, cost-effective" *hybrid,* handset-based technology currently exists.[33] In fact, more testing is needed because the "results are extremely preliminary . . . and the field tests conducted to date are not conclusive."[34] Whenever the technology is developed and deployed, however, unless every CMRS provider overlays the same satellite-based ALI system in every U.S. market even a user with a GPS-equipped phone who "roams" into a non-compatible ALI system will not be located when placing an emergency call.[35] For example, the waiver proponents cite to two, non-compatible handset-based networks. SnapTrack promotes a hybrid network/handset system design that requires both extensive cellular system overlays and GPS chips whereas Integrated Data Communications ("IDC") promotes a different GPS-based system. Neither system can locate users of the other system. To remedy this incompatibility, the Commission or the industry would have to select a single nationwide standard before design, implementation, testing, and retail sales can begin.

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33 See AT&T Wireless Comments at 2.

34 See Sprint Spectrum Comments at 3.

35 See, e.g., Ameritech Comments at 5.

The Commission has made it clear that waivers are intended only in *exceptional* circumstances where compliance is not otherwise achievable.[36] They are not vehicles to buy time or "to preserve [carrier] flexibility,"[37] particularly since grant thereof would extend the deprivation of Phase II ALI to existing users. If the Commission were to grant waivers for this purpose it would effectively be "pick[ing] [the] winners and losers or select[ing] . . . technology to meet consumer demand" in direct violation of its professed neutrality role.[38] For these reasons alone, the waiver requests must be denied.

B. The Standardization, Production, Manufacture and Turnover Required For Deployment of Handset-Based Solutions Will Cause Further Delay

Several waiver proponents assert that the Telecommunications Industry Association ("TIA") is attempting to finalize standards by early 1999. This characterization oversimplifies the standards process and implies that standards for handset-based solutions

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36 See E911 Report and Order at ¶ 84 ("[W]e have found E911 service to be in the public interest. We agree that there may be *exceptional* circumstances where deployment of E911 may not be technically or economically feasible within the five-year general deadline." (emphasis added)).

37 See CenturyTel Wireless, Inc. ("CenturyTel") at 3; Ameritech Comments at 1; Tritel, Inc. Comments at 5; AT&T Wireless Services, Inc. at 6.

38 See In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket No. 98-146, Report, FCC 99-5, ¶ 5 (rel. Feb. 2, 1999).

may be voted on early as March 1999.[39] It further implies that the time frame for the deployment of handset-based is "on schedule," which is incorrect. Actually, the standardization process for handset-based solutions, as any new technology, consists of several stages – the generation of stages I, II and III baseline text, a Validation and Verification of finalized text, and then balloting. This work for the most part must be performed sequentially in up to six different standards bodies.[40] All of these processes are very complex, time-consuming, and are subject to unforeseen delays.[41] Recent examples of these delays are evident in the standards processes for Local Number Portability and Lawfully Authorized Electronic Surveillance. The need for so many standards to change is evident in a December 1998 Strategis Group report showing over 42 million analog subscribers in 2001, and still 40 million remaining in 2003. It is not clear that the analog AMPS standard can even support GPS-based message sets.

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[39] One standards committee, TR45.2 Ad Hoc Emergency Services, of which TruePosition is a member, has scheduled one document for ballot in May of 1999, but the completed Stage III text, representing the bulk of the document, has not yet been submitted by any participating corporation. There are multiple other standards committees that must also initiate and then complete their work. Therefore, the current status of standards work contradicts the assertion that standards for handset-based solutions can be completed by the end of 1999.

[40] The six standards bodies are: TR45.2 AHES (Ad Hoc Emergency Services), TR45.1 (AMPS Air Interface), TR45.3 (TDMA Air Interface), TR45.4 (Base Station to Network Interface), TR45.5 (CDMA Air Interface), and T1P1.5 (PCS Air Interface).

[41] It is common knowledge within the standards community that lack of Stage III text three months prior to a scheduled ballot ultimately results in delay of the ballot. The Validation and Verification of finalized text itself can typically take several months.

Moreover, following completion of the standardization process, research and design and production will further delay the actual availability of handset-based solutions to the *public*. Given that the styling of a GPS handset greatly impacts its level of performance degradation (degradation could be as high as 23 dB or as low as 7 dB),[42] the research and design of GPS handset that is as small as existing digital handsets and that can operate in a variety of environments will take 18-24 months.[43] Similarly, the manufacture of the finished GPS design and its distribution can take another 12 months. Finally, once available, non-GPS-equipped handsets will still be sold until vendors, carriers, and retail outlets deplete their inventories. Accordingly, assertions that handset-based technologies will be deployable, especially on an exclusive basis, between 2000 and 2001 have not taken into addressed the considerable time delays inherent in placing a new product on the market.

In contrast, network-based solutions can provide full inter-operability and are capable of locating wireless 9-1-1 callers without a prolonged standards process. This is evidenced by the fact that TruePosition's network-based location system is commercially deployed and fully operational, including roamer location capabilities, without the aid of standards in Greater Harris County (Houston).[44]

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[42] Degradation is more severe, however, if the handset is indoors, in a vehicle, or even on a belt clip.

[43] See Aerial Communications, Inc. Comments, Nokia Attachment, p. 2.

[44] Similarly, although several waiver requests focused on the purported high costs surrounding a pure network-based system, the waivers were entirely void of any real

Additional delay for handset-based solutions would ensue from the inherent lag time in the turnover of non-GPS compatible handsets. Some waiver proponents predict that ALI-capable phones will take the industry by storm and be the mainstay by 2004.[45] First of all, even if true that would be *three* years late. Second, to assume 100 million users will trade in their phones so quickly is probably wishful thinking. Since many of these users will have already purchased new phones to access today's digital capabilities, it is no small leap (although one virtually every waiver proponent is quick to make) to assume that these users will willingly pay hundreds of dollars for new phones when they suddenly learn that such would be the only way to obtain the ALI protection. Continued phone turnover at today's rate is simply not likely given the additional cost and phone weight/size that GPS chips and antennae will cause and the fact that today's phone churn is due largely to the recent availability of smaller, lighter digital handsets with much greater quality and service features.[46]

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discussion specifying the anticipated costs and cost recovery mechanisms for pure and hybrid handset-based solutions. Given that hybrid solutions under development by SnapTrack and others require design modification to both handsets and the carrier's network, it is unclear how these costs will be recovered.

[45] See AirTouch Comments at 14; US West Wireless Comments at 9; CenturyTel Comments at 5; Powertel Comments at 6.

[46] Many people use old CMRS analog phones purely as unregistered "9-1-1 only" phones, whereas others use recycled, carrier-promoted analog phones for such purposes. See infra p. 27. Another category of ALI "have nots" would consist of the hundreds of thousands of vehicle-mounted analog phones that users simply do not trade in because of the convenience and transmit power they provide.

Moreover, leading telecommunication industry analysts do not support the statistical analyses of a rapid "phone churn" offered by several waiver proponents. For example, data collected from Donaldson, Lufkin & Jenrette ("DLJ") illustrates that even if GPS-handsets are available at the end of 2001, in 2004 *only* 95 million (or 68%) of the total projected 140 million wireless subscribers will have GPS-handsets.[47] Given, however, that many waiver proponents will not be able to offer GPS handsets until the end of the year 2002, by 2004 only 75 million (or 53%) of the total projected 140 million wireless subscribers will be locatable using GPS-based ALI technology.[48] Therefore, the entire process, from technological standardization through retail channel substitution of pre-existing CMRS phones will delay full availability of ALI well into the latter half of the next decade.

III. REQUESTS TO WAIVE THE PHASE II DEADLINE MUST OVERCOME A HIGH BURDEN

Given the risks to human life and property, parties seeking a waiver of the Phase II deadline have a high burden to overcome. Unproven promises of better technology when viable solutions currently exist cannot alone carry that burden. Nevertheless, the

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[47] This illustration makes several assumptions that, since they are not entirely true, skew the results in favor of producing *higher* than probable churn rates, including (1) all new and "churned" customers purchase new, GPS-capable phones; (2) all new phones manufactured and sold are GPS-capable; and (3) churn rates after 2002 remain at their 2002 values. See, e.g., DL J Wireless.

[48] See also infra pp. 25-26, n.62.

Waiver Notice provided handset-based proponents with yet another golden opportunity to show the Commission that handset-based ALI technologies would be worth the wait. In exchange for such a showing, the Bureau expressed a willingness to consider "proposals to phase in implementation" or "applying the Phase II requirements only to new wireless phones."[49] The waiver requests, however, provide none of the Bureau's requested data, such as field test results of actual GPS-equipped handsets or documented timetables of ALI-capable handset deployment. Rather, they simply perpetuate several misconceptions about handset-based and network-based ALI technologies and therefore are full of sound and fury, signifying nothing.

For instance, the waiver requests assert, without any real support, that

- GPS-capable handsets can already locate a 9-1-1 caller within a radius of 90-125 meters. But see infra pp. 21-22, and 27, n.67.
- GPS handsets will provide better accuracy and reliability and will improve even further over time, whereas network-based technologies have limited or no potential for improvement. But see infra pp. 23-24.
- Baseline text for necessary standards will be completed shortly and standards work will be finalized more than two years prior to the Phase II implementation deadline. But see supra pp. 15-17.
- GPS handsets will be available sometime in late 2000 or early 2001. But see supra pp. 17-18.
- Phone turnover rates will be such that 95% of CMRS subscribers could own ALI-enabled phones by the end of 2004. But see supra p. 19.

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[49] See Waiver Notice at 3.

- Handset-based ALI systems will come into Phase II compliance when 67% of the phones in circulation are GPS compatible. But see infra pp. 24-25.

- Roamers and other users with non ALI-capable or non GPS-compatible phones will be locatable by network-based systems. But see infra pp. 27-29.

These ALI myths represent the hopes and aspirations of handset-based waiver proponents and in most cases are simply contrary to well known facts. In short, the waiver requests fail to demonstrate "why this lifesaving service to the American public" should be delayed.[50] Accordingly, the Commission should disregard the unproven hype that ALI handsets are indeed a better ALI technology.

A. Significantly Higher Level of Accuracy and Reliability

In the Waiver Notice, the Bureau stated that it would consider granting waivers where a carrier demonstrates that, as a consequence of the waiver, it ultimately could provide more accurate ALI technology than it could absent a waiver. Greater accuracy than 125 meters RMS, however, is not enough. For example, TruePosition's system deployed in Houston can already attain ALI accuracy to within 80 meters RMS in indoor areas and better than 40 meters RMS in other environments. TruePosition is working on technical improvements that it expects will enhance this accuracy level even further. To the extent that

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[50] See Kennard Speech at 6.

carriers proposed specific improvements in accuracy beyond 125 meters (most did not), they limited their offerings to 90 meters.[51]

Thus, waiver proponents are offering "to *explore* implementing more accurate standards" that are in fact technologically *behind* network-based capabilities of today and are probably further behind comparable network-based expectations of tomorrow.[52] Further, reliance on such handset-based hopes and "explorations" will provide *no* location solutions for more than a year and will forgo the vast majority of CMRS users until well into the next decade. Waiver recipients would not be able to comply with the 125 meters RMS standard until at least 99.5% of phones are GPS equipped, even assuming they could attain an accuracy level of within 10 meters.[53] This hardly represents a valuable trade-off in terms of public safety, and certainly fails to justify the lives that may be lost if full implementation is delayed.

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[51] See, e.g., Ameritech Comments at 2; Powertel Comments at 2. Notably, this 90-meter proposal is *not* 90 meters RMS. See infra p. 12, n.29.

[52] See CenturyTel at 6 (seeking to condition waiver on its commitment to explore more accurate ALI technology); Ameritech Comments at 2.

[53] If 99% of the phones could achieve 10-meter accuracy and one percent were located using Phase I cell site data (error of one mile or 1600 meters), the overall error would be 160 meters RMS. This underscores the need to locate *all phones* using Phase II information.

Moreover, technology will always improve,[54] and improvements that are not fully implemented until well after the 2001 deadline will not be of any use to the millions of CMRS users that place 9-1-1 calls in the meantime. This is particularly true when the proposed "improvements" fail to take into account the contemporaneous improvements in competing technologies. Indeed, the waiver requests ignore the propensity for network-based ALI solutions to improve further over time. As noted, with a number of enhancements, network-based approaches have already achieved even greater accuracy than 125 meters RMS. With its partnerships with Ericsson, Inc. and Corsair Communications, Inc.,[55] TruePosition now has access to wireless platforms needed to make even greater enhancements to its wireless location system, and is doing so every day. For example, by integrating its system into carriers' networks, TruePosition can create a "bandwidth synthesis," which can increase the effective bandwidth of CMRS signals for location purposes, thereby improving the location estimate. With these enhancements, TruePosition

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[54] The Commission may not, however, establish standards for the future based on expectations of future technology development that are not currently attainable with existing technology. See EIA consumer Electronics Group v. FCC, 636 F.2d 689 (1980)(UHF noise figure).

[55] See Attachment 4, "Corsair and TruePosition Announce LOI for Joint Marketing Services Agreement," Corsair Communications Inc. Press Release, February 3, 1999 ("Corsair Release") (announcing agreement to market and sell TruePosition's wireless location and withdrew its plans manufacture its own PhoneTrack location system); see also Attachment 5, "Ericsson, TruePosition Sign Joint Marketing Agreement for Mobile Positioning Technology," Business Wire, January 28, 1999 ("Ericsson Article").

expects to achieve even better accuracy in locating CMRS users, so that the TruePosition system will continue to "best meet the requirements of the Federal Communications Commission's E-9-1-1 rules as well as those of many service providers."[56] More importantly, the time frame required to implement these enhancements is still *far shorter* than the implementation time frame purported by handset-based proponents.[57] Therefore, contentions that network-based systems "show limited potential for accuracy improvement with time"[58] are just plain wrong.

Additionally, several waiver proponents mischaracterize the required ALI reliability standard. Specifically, several commenters suggest that the Commission's ALI accuracy standard of 125 meters using RMS methodology means simply that a carrier must

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[56] See Ericsson Press Release (quoting Bo Dimert, President and CEO of Ericsson Inc.).

[57] Network-based approaches can work with wireless infrastructure to better the parameters that affect location technology: effective signal bandwidth, signal-to-noise ratio, and integration time. Because both the phone and the location system are terrestrial and controllable, dramatic improvements in location accuracy are achievable within months and should accelerate once carriers begin to place more systems in trials and commercial installations. Further, all of these improvements are possible with existing phones. By contrast, GPS signals are transmitted from satellites and are fixed in terms of signal bandwidth and signal-to-noise ratio and cannot be controlled. Regardless of their purported "better accuracy," there is a limit on accuracy gain that can be achieved. Accordingly, due to the fixed nature of the GPS signal, GPS handsets' accuracy will stagnate because the potential for improvement will have been exhausted.

[58] See Sprint Spectrum Comments at 3.

be able to locate 67% of mobile units within the 125 meters RMS standard.[59] This is not true. In fact, in its E911 Memorandum Opinion and Order the Commission specifically clarified that *every* CMRS 9-1-1 call must be locatable. The Commission specifically stated that it "expect[s] that any Phase II ALI technology deployed by a carrier, whether it is a network-based approach or any other approach . . . to reach this level of accuracy in identifying the location of *each* 911 call."[60] The use of an RMS methodology to determine distance was designed to ensure that *all* calls would be located beyond mere Phase I standards with, "approximately 67% to 75% probability that the reported location would be within 125-meter radius of the caller's actual location."[61] Thus, carriers will *not* be in compliance with the ALI rules when merely 67% of the phones in circulation are GPS-equipped since even then one-third of the users, and possibly more than one-third of the 9-1-1 calls, will never have any Phase II location detection.

B. Early Implementation

Second, the Bureau said it would consider early implementation as a possible criteria to justify a waiver. Waiver proponents, however, offered no such thing. Some waiver proponents suggested they would *begin* offering GPS-capable handsets generally by

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59 See, e.g., PrimeCo Personal Communications, L.P. Comments at 2, 5, 7; US West Wireless, L.L.C. Comments at 5-6; Ameritech Comments at 2; Powertel Inc. Comments at 2-3; AirTouch Comments at 6; see also infra n.67.

60 See E911 Memorandum Opinion and Order at ¶ 126 (emphasis in original).

61 Id. at ¶¶ 125-26.

early 2001 or 2002.[62] To begin with, this would not constitute early compliance because most users – all those with pre-existing phones and even new handset purchasers roaming into non-compatible ALI systems – would still lack ALI protection for several years. Moreover, several factors could delay this initial availability date, including further testing delays, continued standards-setting debates, and vendor inability to incorporate chips economically or in a customer-friendly fashion. In short, any slippage even in the best-intended delivery dates would nullify any possibility of early commencement and further prolong full Phase II compliance.[63]

In contrast, network-based ALI is available for *all* users. The only way the Bureau can encourage real, effective "early implementation" is to reiterate that it will not excuse Phase II compliance, whereupon carriers can immediately begin implementing network-based ALI systems.

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[62] See Sprint Spectrum L.P. Comments at 4-5; US West Comments at 8 (stating that GPS-capable handsets could be available the fourth quarter of 2000); CenturyTel Comments at 5 (stating that it will begin offering GPS-capable handsets on January 1, 2002).

[63] In light of the fact that none of the competing GPS wireless location techniques have completed their development, the standards process for selecting between these systems is likely to lead to substantial delays while the systems are improved. Any Commission rulemaking proceeding that leads to the adoption of standards for GPS use in cellular handsets would take at least a year to complete. Such a time delay caused by the standards-development process will further deprive the public of the life-saving benefits of ALI Phase II technology. For a full discussion of these inevitable delays see supra pp. 15-17.

C. Treatment of Roamers and Non-GPS Users

Third, the Waiver Notice required waiver proponents to demonstrate how roamers and home subscribers with non-ALI capable handsets would be afforded ALI protection. Absent meaningful steps that can address this problem, as described earlier, roamers and tens of millions of home subscribers will be denied essential ALI protection.[64] Moreover, a waiver or rule change would also undermine the Commission's well-deliberated decision to ensure that unregistered "safety net" phones be protected by Phase II ALI technology.[65]

The waiver requests offer no remedy for these problems because they are basic flaws of handset-based solutions.[66] Waiver proponents concede that such technologies will not, even when available, extend to pre-existing CMRS phones. In fact, even three or four years after the implementation deadline, if, as some proponents speculate, 90% of all handsets in use could be GPS equipped, the GPS handset technologies would still fail to

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64 This is especially true for a growing number of people whose *only* telephone is their CMRS phone. Non-universal ALI implementation will prevent these CMRS subscribers from being locatable until they purchase a new phone.

65 See E911 Memorandum Opinion and Order at ¶¶ 33-35.

66 Several commenters acknowledge that "[h]andset technology has not evolved." See Arctic Slope Telecommunications Comments at 4; USCC Comments at 4 (asserting that GPS handsets will not be able to minimize the roamer problem and that the Commission should acknowledge incompatible ALI systems will not work).

comply with the 125 meters RMS standard.[67] Thus, grant of waivers would bestow a *privilege* of safety to only a fraction of the U.S. population that purchases or can afford to purchase ALI-capable phones after October 2001.[68]

Waiver proponents suggest, however, that there will be other, network-based ALI systems to cover these "have not" users.[69] This is not true for two reasons. First, there may not be a network-based system in the carrier's market. In fact, if the Bureau were to grant the instant waiver requests, the remaining carriers would surely seek the same treatment. Second, even if there is, the particular user's 9-1-1 call will not simply be picked

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[67] If we were to assume that GPS could locate 90% of all wireless 9-1-1 callers within even *10* meters, with the remaining 10% of wireless callers being located only by cell site and sector (*i.e.*, Phase I ANI), a carrier still would not meet the standard. An RMS calculation based on the above assumptions Square Root [$(90x10^2 + 10x1600^2)/100$], using a cell site phase I error of only 1 mile, would result in an accuracy rate of 506 meters RMS, roughly 380 meters away from the Commission's accuracy rate.

[68] This dichotomy is particularly detrimental to carrier-sponsored community service projects, such as Bell Atlantic's "Wireless at Work program," that recycle and reprogram older model and donated phones to dial 9-1-1 at a touch of a button. These projects attempt to improve public safety by putting emergency service in the hands of the victims or community groups that need it most, but cannot afford new phones, such as victims of domestic violence, crossing guards and watch groups. See "Bell Atlantic Mobile Donates 50 Wireless Phones to Victims of Domestic Violence," Press Release, October 1, 1998; "Bell Atlantic Mobile Donates 200 Wireless Phones to New York City Crossing Guards," Press Release, November 9, 1998<http://www.bam.com/news>. In cases of emergency, the recipients of such phones would not be locatable through handset-based technologies regardless of the technology's increased accuracy. See also infra pp. 25-26.

[69] See Ameritech Comments at 5; US West Comments at 10-11; Powertel Comments at 4-5.

up by a network-based ALI system associated with a competing CMRS network just because the user's home system (or primary roaming system) cannot transmit the user's ALI.

In addition, waiver proponents assert through the illustration of matrices that a *minor* roaming problem would exist only when a carrier has a handset-based ALI solution and the CMRS users' handset is not location enabled. Waiver proponents assert further that this problem will be less significant over time as CMRS users purchase new ALI-capable handsets. Their argument overlooks the *major* fact that throughout their original analysis, the waiver proponents underestimate the number of non-GPS handsets that will exist in the market in the years following the 2001 deadline. As demonstrated above, there will be as many as 100 million CMRS users without GPS handsets, which makes the "roamer problem" very significant to an increasingly large number of CMRS users , whether they are roamers or not. Moreover, the Commission's rules require that carriers locate roamers with the same accuracy and reliability as "home" CMRS users.[70] Thus, failure to locate even a small number of roamers would amount to non-compliance with the Commission's rules. Finally, the matrices fail to address the roaming problem that will exist due to the incompatibility of different handset-based technologies. As stated earlier, unless GPS handset-based ALI technology is standardized nationwide, a carrier with one ALI handset technology will not be able to locate a roamer calling with a different ALI handset technology.

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[70] See E911 Memorandum Opinion and Order at ¶ 126.

IV. CONCLUSION

The Commission's statutory mandate requires it to "promote safety of life and property through the use of wire and radio communication."[71] The implementation of wireless E911 derives from the Commission recognition in 1996 that E911 saves lives. The Bureau cannot now, in 1999, allow "phasing in" or delaying implementation of this life-saving tool without *endangering* lives and property. A wholesale grant of waivers would amount to a *de facto* amendment to the E911 rules.[72]

The Bureau must examine the relevant data and articulate a satisfactory explanation for its decisions, and the explanation must demonstrate a "rational connection between the facts found and the choice made."[73] If the Bureau's decision "runs counter to the evidence before [it]," the decision is arbitrary and capricious.[74] To be sure, the waiver requests before the Bureau have not and cannot meet the Commission's traditional waiver standards[75] or the Waiver Notice guidelines. The only thing that is clear is that handset-based

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[71] 47 U.S.C. § 151.

[72] Indeed, most of the waiver requests concede that they seek either an "industry-wide waiver" or a "rule change."

[73] Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962).

[74] Motor Vehicle Manufacturers Assoc. of the United States v. State Farm Mutual Automobile Insurance Co., 463 U.S. 29, 43 (1983)

[75] See WAIT Radio v. FCC, 418 F.2d 1153 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972); see also Northeast Cellular Telephone Co. v. FCC, 897 F.2d 1164 (D.C. Cir. 1990).

solutions still cannot meet the Phase II requirements and will not be able to do so for several years. The Bureau's failure to acknowledge these facts, or the delay caused by the grant of E911 waivers, would be a gross error of judgment, especially given the Commission's previous determinations that E911 implementation is imperative to the lives and safety of CMRS and non-CMRS users.

Accordingly, the Bureau must deny the waiver requests and reiterate the mandate for timely implementation of wireless E911.

Respectfully submitted,

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Dated: February 16, 1999

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TruePosition Releases series 2 Wireless Location System

Wayne, PA, February 1, 1999 - TruePosition, Inc. announced today that it will release its series 2 TruePosition® Wireless Location System at the CTIA Wireless '99 convention in New Orleans. The series 2 System is an advanced hardware architecture designed to support all analog and digital air interface standards used by wireless carriers today.

The TruePosition Wireless Location System is designed to meet the requirements of the Federal Communications Commission's Wireless E-9-1-1 rules and other commercial location applications. The System, utilizing patented time difference of arrival (TDOA) algorithms, overlays existing wireless carrier networks and requires no changes to the existing wireless handset base of over 68 million subscribers.

Over the last 3 years, extensive field trials of the TruePosition System have been conducted in a number of environments, including systems as large as 125 cell sites and covering terrain from dense urban to rural areas. TruePosition is the only system to date that has been used to locate thousands of live wireless 9-1-1 calls, and the only system in commercial installation.

The series 2 System evolves from TruePosition's proven analog-only System and utilizes advanced wideband digital receivers that are capable of simultaneously listening to all frequencies used by different cellular or PCS systems. The series 2 System includes control channel and voice channel location capability, dual-mode analog/digital location processing, LocationGuard™ privacy protection for subscribers, Pathfinder™ multipath

mitigation algorithms, a scalable hardware architecture to match different cell site configurations, and new support for low site density installations such as rural areas.

"Our goal is to make the TruePosition System the most accurate and lowest cost approach to locating ***all*** wireless telephones," said Kent Sander, president and chief operating officer of TruePosition. "The series 2 System and our partnerships with Shell and Ericsson demonstrate our commitment to delivering the best location technology solutions for public safety and commercial applications."

TruePosition, Inc. is a leading provider of wireless location technology and services. TruePosition is a wholly-owned subsidiary of The Associated Group, Inc. (Nasdaq: AGRPA, AGRPB), a diversified communications company with ownership and operation of a variety of communications businesses and interests, including TruePosition; a controlling interest in Teligent, Inc., a full-service, integrated communications company offering local, long distance, high-speed data and dedicated Internet services over its fixed wireless local networks; and a significant interest in Tele-Communications, Inc.

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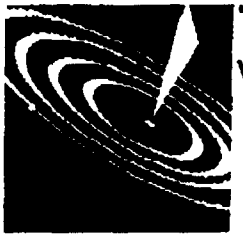

TruePosition®
Wireless Location System

FOR IMMEDIATE RELEASE
November 11, 1998

CONTACT: Michael Amarosa, TruePosition, Inc.
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TruePosition, Inc. and Shell Affiliate Announce Agreement To Develop Commercial Location Services

Houston (November 11, 1998) – Equiva Services LLC, an affiliate of Shell, and TruePosition, Inc. announced today they have signed an agreement to jointly develop and market location-based services and applications using the TruePosition® Wireless Location System™. Under the agreement, the two companies will combine their efforts to accelerate the deployment of wireless location systems and related value-added applications across North America for the motorist and the individual consumer.

To date, wireless location technology has been associated with the Federal Communications Commission's mandate to locate wireless E9-1-1 callers. However, both companies see a significant market opportunity in new services, such as stolen vehicle recovery, automatic crash notification, enhanced "concierge" information programs, and enhancements to the Shell Motorist Club roadside assistance program.

Kent Sander, president and COO of TruePosition, added, "We're excited to be working with Shell and their vision for the future. We think Shell's product innovation, strong consumer marketing, and worldwide brand recognition will help fuel the growth of these new markets. As we have stated, part of TruePosition's mandate is to expand beyond E9-1-1 services and create new value for wireless networks."

"This new location technology, combined with Shell's automated fueling and other services, is part of our new innovation-based strategy, and these capabilities set Shell at the forefront of gasoline retailing technology," said Sam Morasca, vice president of marketing and brands management for the Shell brand. "Our objective is to provide the motorist with safe, quick, simple to use products and services which can save them time and money. For example, TruePosition offers the best location technology available for pursuing new service applications for Shell customers. The Shell Motorist Club will be able to expand its programs to serve an increasingly mobile society, and we have found a partner with significant wireless experience."

"Shell and TruePosition are identifying new commercial services designed for motorists and the general public, including vehicle management with on-board diagnostics, tracking stolen vehicles and notifying the police, providing entertainment programs and games for families on the road" says Kevin Autin manager business development/fuel delivery systems for the Shell brand.

"The TruePosition system exemplifies how people can Count on Shell™ to help build a better world," says Sixtus Oechsle, executive director, Corporate Identity, Shell Oil Company. "Further, its tracking capabilities offer real help to people in emergency situations. TruePosition and the Count on Shell safety campaign will work hand in hand to educate and respond with accuracy to anyone needing assistance."

Early results of the Shell and TruePosition relationship are evidenced in the recently announced agreement with the Greater Harris County 9-1-1 Network to provide wireless 9-1-1 location services in the Houston area. While the agreement itself was focused on wireless E9-1-1, interest in exploring consumer-related applications was a catalyst for all parties involved in the deployment.

Shell gasoline is marketed in more than 9,000 Shell-branded stations in 39 states nationwide.

TruePosition, Inc. is a leading provider of wireless location technology and services. TruePosition is a wholly-owned subsidiary of The Associated Group, Inc. (Nasdaq: AGRPA, AGRPB), a diversified communications company with ownership and operation of a variety of communications businesses and interests, including TruePosition; a controlling interest in Teligent, Inc., a full-service, integrated communications company offering local, long distance, high-speed data and dedicated Internet services over its fixed wireless local networks; and a significant interest in Tele-Communications, Inc.

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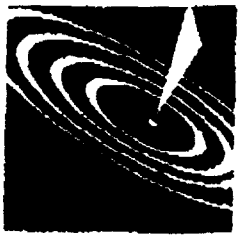

TruePosition®
Wireless Location System

Contaot: Michael Amarosa
TruePosition, Inc.
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TruePosition Releases TDMA Modules For Wireless Location System

Wayne, PA, February 1, 1999 - TruePosition, Inc. announced today that it has commenced production of AMPS/TDMA modules for the series 2 TruePosition® Wireless Location System. The AMPS/TDMA modules, which are the first available for the new series 2 System, have successfully completed laboratory testing and begun field trials.

TruePosition has already been extensively tested and proven in various analog (AMPS) wireless networks of up to 125 cell sites. With the release of the AMPS/TDMA modules, TruePosition is now capable of covering over 85% of the existing U.S. wireless subscriber base. Additional modules are expected soon to cover subscribers using other air interface standards.

More than 100,000 emergency calls per day are made from wireless telephones – more than double the number just five years ago, and the Federal Communications Commission (FCC) has required that, no later than October 1, 2001, wireless carriers implement systems capable of locating all wireless 9-1-1 callers, including the embedded base, to within 410 feet root mean square (RMS) and convey that location information to public safety answering points which handle 9-1-1 calls. Furthermore, several major market studies show a growing demand for commercial location services such as fleet management, roadside assistance, and package tracking.

Kent Sander, president and chief operating officer of TruePosition, said, "We're proud to be the first company delivering commercial TDMA location systems, especially so far

ahead of the FCC mandate. TruePosition is committed to delivering the most accurate and lowest cost approach to locating *all* wireless telephones."

The TruePosition Wireless Location System is based on patented time difference of arrival (TDOA) and Pathfinder™ multipath mitigation technology. Overlaid on existing wireless carrier cell sites, the TruePosition system requires no changes to the existing wireless handset base, estimated to be in excess of 68 million subscribers. Furthermore, the System minimizes changes to wireless carrier networks by sharing the existing antennas and cabling at cell sites.

TruePosition can be installed in any digital cellular system using the Time Division Multiple Access (TDMA) air interface protocol because the System can operate independent of the wireless infrastructure. Additional benefits are expected at cell sites equipped with Ericsson equipment because TruePosition and Ericsson recently announced an agreement to develop and market a mobile positioning solution for TDMA (IS-136) networks based on the TruePosition Wireless Location system and the Ericsson Mobile Positioning Center.

TruePosition, Inc. is a wholly-owned subsidiary of The Associated Group, Inc. (NASDAQ: AGRPA, AGRPB), a diversified communications company with ownership and operation of a variety of wireless communications businesses and interests, including TruePosition, a controlling interest in Teligent, Inc., a facilities-based wireless competitive local exchange carrier, a controlling interest in a Mexican cellular operator, radio broadcasting stations, and a significant interest in Tele-Communications, Inc.

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Attachment 4

Corsair and TruePosition Announce LOI for Joint Marketing and Services Agreement

Wednesday, February 3, 1999 04:02 PM

PALO ALTO, Calif.--(BUSINESS WIRE)--Feb. 3, 1999--Corsair Communications, Inc. (Nasdaq:CAIR) announced today that it has signed a letter of intent with TruePosition, Inc., a wholly owned subsidiary of The Associated Group, Inc. (Nasdaq: AGRPA, AGRPB) to cooperate on joint marketing of network-based wireless transmitter location products and services.

Under the terms of the letter, Corsair and TruePosition will work toward a final agreement for the joint marketing and selling of the TruePosition(TM) wireless location system. Corsair would use its sales and marketing team to introduce TruePosition to accounts and distribution partners with which Corsair has established relationships. The two companies would cooperate to leverage Corsair's operations and field engineering personnel to support the TruePosition system. Corsair would make certain intellectual property available to TruePosition and would no longer be involved in the manufacture of the PhoneTrack(TM) location system.

"This agreement leverages the strengths of both companies to offer the best solution for the marketplace," said Corsair President and CEO Mary Ann Byrnes. "We look forward to working with TruePosition in the wireless location market."

Corsair is a leading provider of software and system solutions for the wireless industry, focusing on fraud prevention and churn reduction, prepaid wireless billing, and wireless location.

TruePosition, Inc. is a leading provider of wireless location technology and services. TruePosition is a wholly owned subsidiary of The Associated Group, Inc. (Nasdaq: AGRPA - news, AGRPB - news), a diversified communications company with ownership and operation of a variety of communications businesses and interests, including TruePosition; a controlling interest in Teligent, Inc. (Nasdaq:TGNT - news), a full-service, integrated communications company offering local, long distance, high-speed data and dedicated Internet services over its fixed wireless local networks; and a significant interest in Tele-Communications, Inc.

Note: This press release may contain forward-looking statements that involve risks and uncertainties. Actual results may differ materially because of various risks, including risks associated with product sales and installation, successful completion of potential transactions, demand for Corsair's products and services, continued growth of the wireless telecommunications industry, and other risks associated with Corsair's business. For an expanded discussion on such risks, please see the documents filed by Corsair Communications with the U.S. Securities and Exchange Commission.

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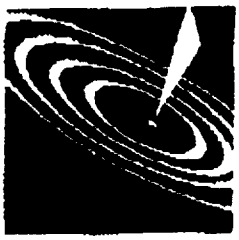

FOR IMMEDIATE RELEASE

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ERICSSON, TRUEPOSITION SIGN JOINT MARKETING AGREEMENT FOR MOBILE POSITIONING TECHNOLOGY

Richardson, Texas – January 28, 1999 – TruePosition, Inc., Wayne, Penn., and Ericsson announced an agreement to develop and market a mobile positioning solution for TDMA (IS-136) networks based on the TruePosition Wireless Location system and the Ericsson Mobile Positioning Center.

Under the agreement, Ericsson and TruePosition will work to accelerate the deployment of wireless location systems to support E-9-1-1 requirements and other commercial applications. The agreement initially focuses on Ericsson's TDMA/AMPS customers in the United States and Canada.

"Ericsson has impressed us with its Wireless Intelligent Network and Mobile Positioning Center technologies as a platform for supporting location-based applications," said Kent Sander, president and chief operating officer of TruePosition.

- MORE -

"After evaluating multiple network and handset location technologies, we concluded this joint effort will be the best approach for our large installed base of cell sites and wireless telephones," said Bo Dimert, president and chief executive officer, Ericsson Inc. "We think their system can best meet the requirements of the Federal Communications Commission's Wireless E-9-1-1 rules, as well as those of many service providers."

TruePosition, Inc. is a leading provider of wireless location technology and services. TruePosition is a wholly owned subsidiary of The Associated Group, Inc. (Nasdaq: AGRPA, AGRPB), a diversified communications company with ownership and operation of a variety of communications businesses and interests, including TruePosition; a controlling interest in Teligent, Inc., a full-service, integrated communications company offering local, long distance, high-speed data and dedicated Internet services over its fixed wireless local networks; and a significant interest in Tele-Communications, Inc.

Ericsson is the leading provider in the new telecoms world, with communications solutions that combine telecom and datacom technologies with the freedom of mobility for the user. With more than 100,000 employees in 140 countries, Ericsson simplifies communications for its customers – network operators, service providers, enterprises and consumers – the world over.

Please visit Ericsson's Press Room at http://www.ericsson.se/pressroom

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CERTIFICATE OF SERVICE

This is to certify that the attached document has been served by first-class mail, postage prepaid, on this 16th day of February, 1999, on the following:

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